Construction Site Storm Water Runoff Control

Harry Campbell, P.E.
Construction SW Coordinator
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Key Program Parts

- Ordinance
- Site Plan Review
- Inspection
- Enforcement
- Outreach/Education

Ordinance

- Erosion & sediment controls
  - Threshold, 1 acre and greater; smaller
- SWPPP, reduce pollutants to MEP, Min
  - Bldg waste, concrete washout, chemicals, litter, sanitary waste, etc.
- Sanctions to ensure compliance
- Access

Site Plan Review

- WQ Impacts from Construction
  - Standard Conditions of Approval; NOI, State Const. Permit, etc.
  - Review of appropriate E & S BMPs
- Adequate Training for Reviewers
  - Training, records of training
- Guidance for Developers/Engineers/Contractors
  - Strategy, Details, Specifications
  - Classes, handouts, on-line info
- Pre-construction meeting

Vicinity Map

NO TO SCALE

Storm Runoff Calculations

Courtyard at 1600
01/10/06 RAT

The following runoff calculations are based on the Rainfall - Intensity - Duration Frequency Curve for the Ogden area taken from data compiled by the Weather Bureau in Technical Paper No. 28, using a 10 year storm.

Runoff storm water has been calculated for two different sets of conditions, one being the existing undeveloped land and the other with land fully improved. The difference between the two quantities will be retained in a holding pond. All water that runs off and over the property at present will be diverted into the holding pond and released at a reduced rate into the existing drainage system.

The calculations are as follows:

1. Runoff from the undeveloped existing land.
   - Runoff Coefficient C = 0.19
   - Rainfall Intensity I = 1.05 IN./HR.
   - Runoff Quantity Q = CiA
   - Acreage A = 3.00 ACRES

   Q(out) = C**A = 0.60 CFS .2 cfs/acre

2. Runoff from developed land
   - Runoff Coefficients
     - Paved Area 31268 C = 0.9
     - Landscaped Area 55936 C = 0.2
     - Other Area 0 C = 0.23
     - Roof and Driveway Area 43343 C = 0.8
   - Weighted Runoff Coefficient C = 0.57
   - Rainfall Intensity I = varies with time
   - Runoff Quantity Q = CiA

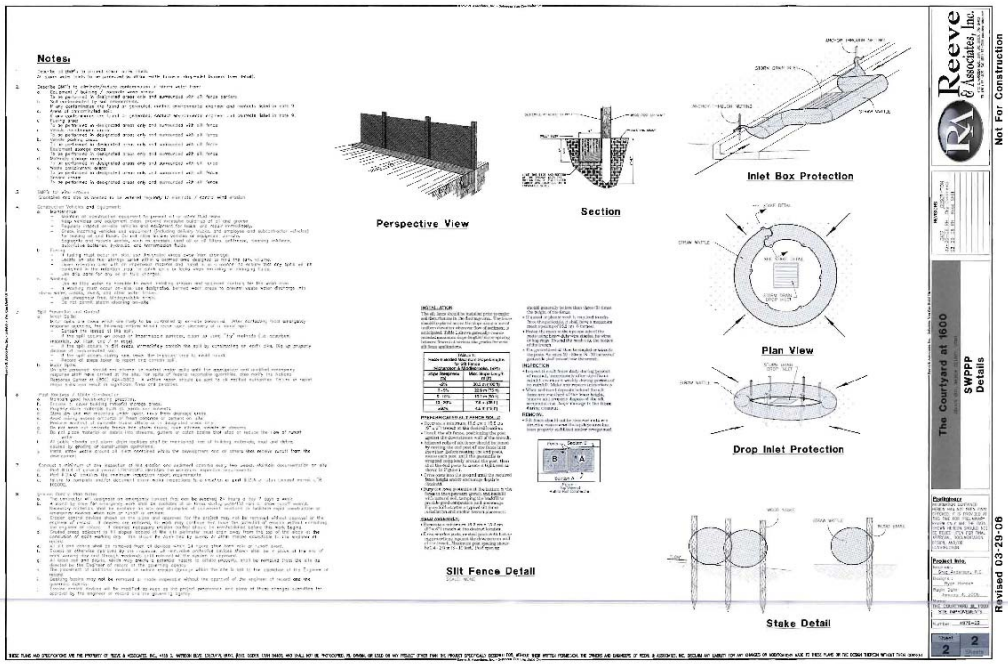
3. Detention Basin
   - Volume in Q * t
   - Volume out 0.60 * t

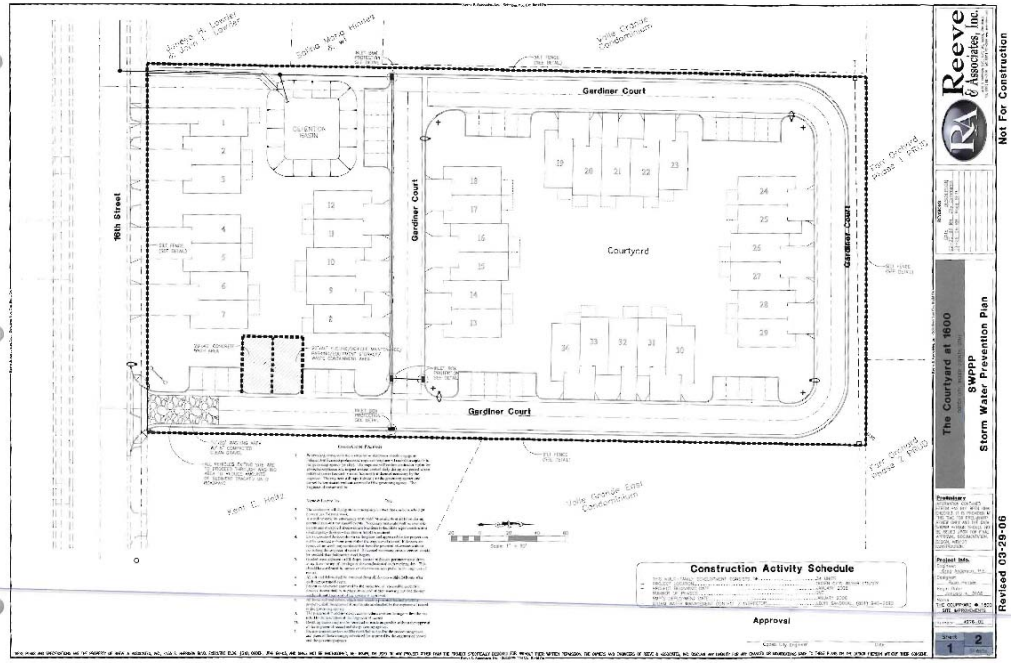
The capacity of the detention basin is calculated as the maximum difference between the volume flowing in and the volume flowing out.

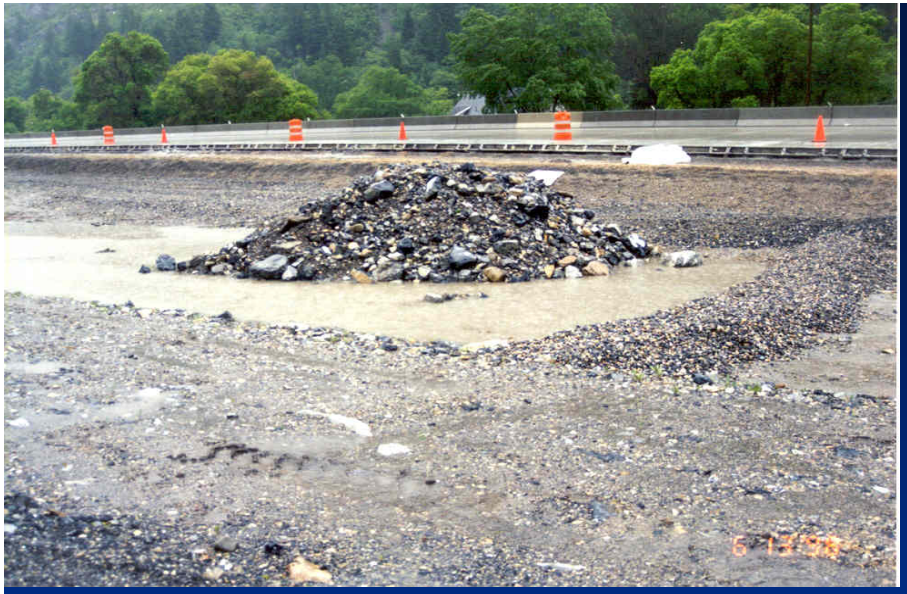
The outflow from the detention basin is limited to outflow if undeveloped.
Use 0.60 cfs for Q outflow

The required volume of the detention basin is 4,575 cubic feet

USE A 3.6 INCH DIAMETER ORIFACE AT OUTLET

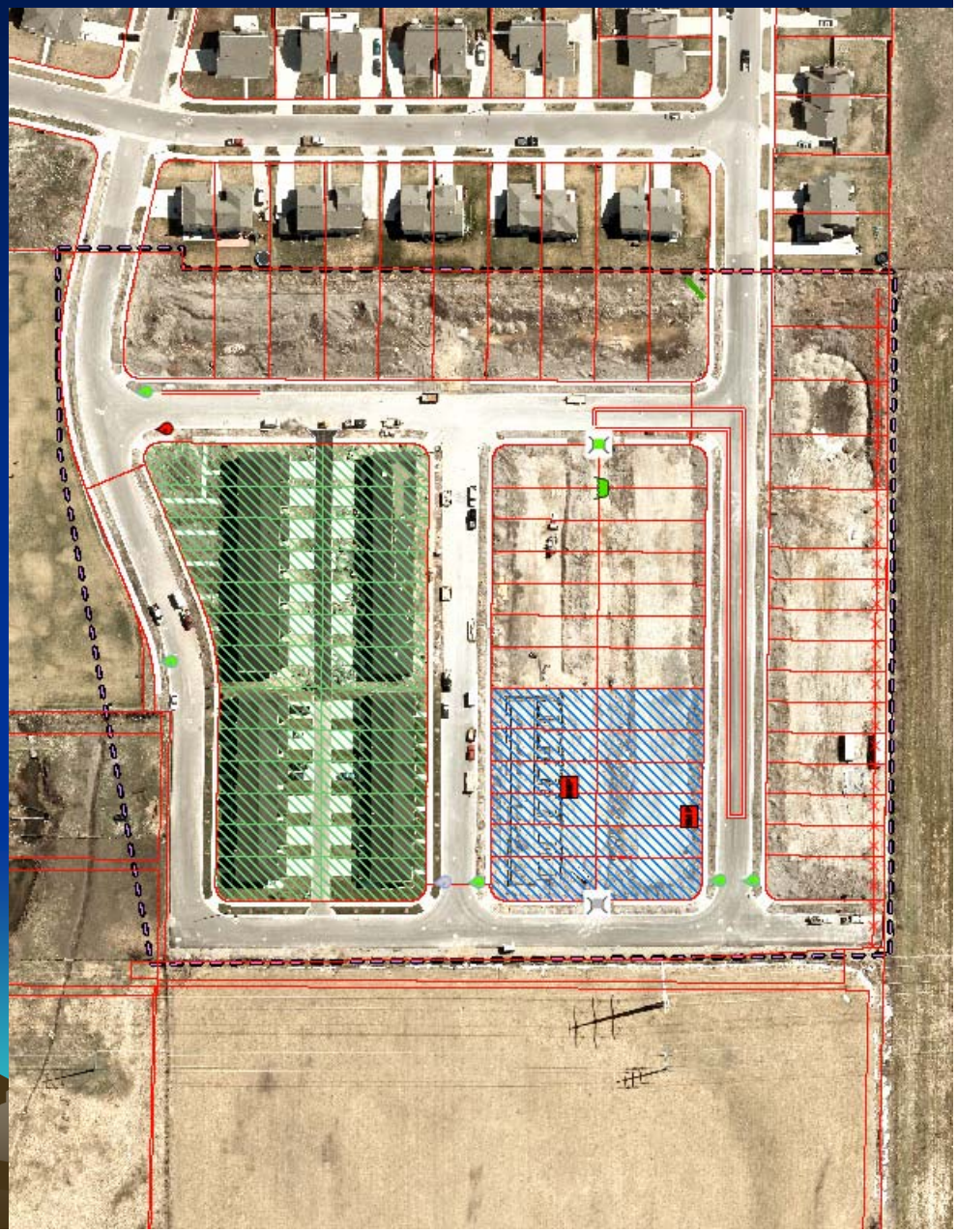






Inspections

- Procedures for inspection
  - Priority, (impacted WB, proximity, size, slope)
  - Who inspects?
- Assessment of site
- Inventory, tracking, records of sites.
- Trained Inspectors, (cross-train)
- Oversight of MS4 projects?




03/13/2009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Enforcement

- Ordinance or regulatory mechanism
  - Who is enforcer?
  - NOV, Fine, Stop Work Order, Civil/Criminal penalties
- Escalating procedures & actions
- Documentation, tracking, records
- Follow up

Education/Training

- Training for MS4 inspectors
- Outreach – Developers & Contractors
- Those involved in in-house projects
- Outreach/Education/Training
  - specifications and acceptable BMPs
    - Classes,
    - Brochures, outreach material,
    - on-line info.
- Records of training

Post Construction

Change philosophy from disposing of SW quickly using engineered systems to mitigate impacts, reverse damage caused by development, apply LID, emulate functions of natural systems to reintegrate rainfall into the water cycle rather than disposing of it as a waste product.

Key Program Points

- Ordinance
- Site Plan Review
  - BMP Selection
  - Long Term Maintenance
- Inspections
- Enforcement
- Education/ Outreach

Ordinance

- Legal authority
- BMP selection, design, installation, operation, maintenance.
- 1 acre and greater; common plan.
- Sanctions
- Access
- MS4 Agency?

Site Plan Review

- Pre-construction review, post const. BMPs
  - BMP selection review and approval
- Qualified person, trained & knowledgeable
- Records (plans, decisions, mtg minutes)
  - for inspecting, enforcement, tracking & forwarding when finished.
- Long term maintenance

BMP Selection (MS4 & Developer)

- Comprehensive or Master Planning
  - Geological considerations
  - Land use considerations
  - Density considerations
  - Non-structural BMPs (riparian buffers, open space, vegetative strips, limitations on impervious surface).
- Natural Drainage
- LID (infiltrate, filtrate, store, evaporate, detain)
- Pre-development flows
- Proprietary products.
- Hydrologic design method specifications


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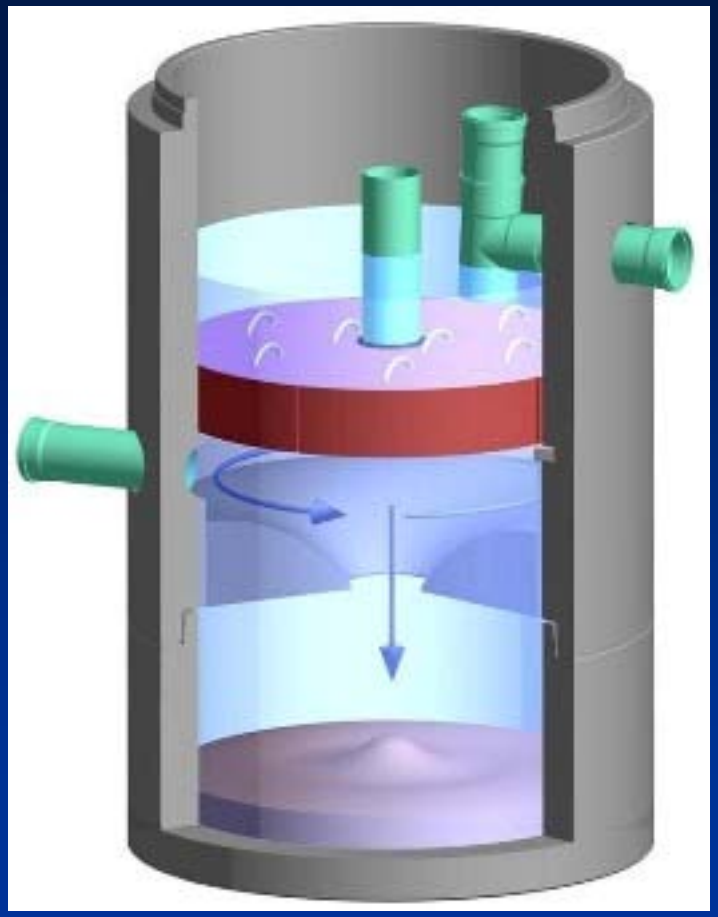

Long Term Maintenance

- Development approval process, site plan review, pre-design meeting,
- Determination of BMP ownership
- Access to private property
- 3rd Party inspection & maintenance certification
- Oversight Converted to permanent MS4 SW system O&M Schedule

Inspections/Enforcement

- Inspection frequency
  - Once during construction
  - Once/5yrs after completion
- Require appropriate installation
  - Bonding
  - Other enforcement

Outreach/Education

- Developers & Contractors
- MS4 inspectors, reviewers
- Training/Information
  - Classes
  - Hard copy (brochures, handouts)
  - On-line

Save questions until after other hot topics speakers

Harry Campbell, P.E.

SW Coordinator Construction Activities

hcampbell@utah.gov

801-538-6923